

MAINTENANCE MANUAL

C3 MAESTRO CONSOLE SYSTEM

INSTALLATION, SET-UP AND TESTING

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NOTE

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GENERAL

The intent of this manual is to guide field installation and maintenance personnel through the installation, set-up and testing of a C3 Maestro dispatch console system. Figure 1 shows basic equipment interconnections.

This document was developed in accordance with:

- C3 Maestro (PC) application software version 3.0x (344A3922G10)
- C3 Maestro Logic Board firmware version 3.02 (344A4245G10)
- C3 Maestro Logic Board hardware revision B (344A3927P24 or P29/5000060001)
- C3 Maestro Audio Tower later-revision hardware commonly referred to as "Phase 2" (board assemblies designated with a P29/772xxxxxx part number)
- CEC/IMC Digital Audio Switch firmware version

3.06 (344A3564G10, 344A3565G10, 344A3567G10 and 344A3568G10)

- CEC/IMC Manager (MOM PC) software version 3.05 (344A3630G10)

Although specifically written for the firmware, software and hardware listed above (and subsequent versions), most information in this document also directly applies to earlier C3 Maestro console systems. In most cases, direct references are made to these earlier items and the differences are described.

NOTE

C3 Maestro application software version 3.0x requires C3 Maestro Logic Board firmware version 3.02 (or later), CEC/IMC Controller and Audio Board firmware version 3.0x (or later), and CEC/IMC Manager software version 3.0x (or later).

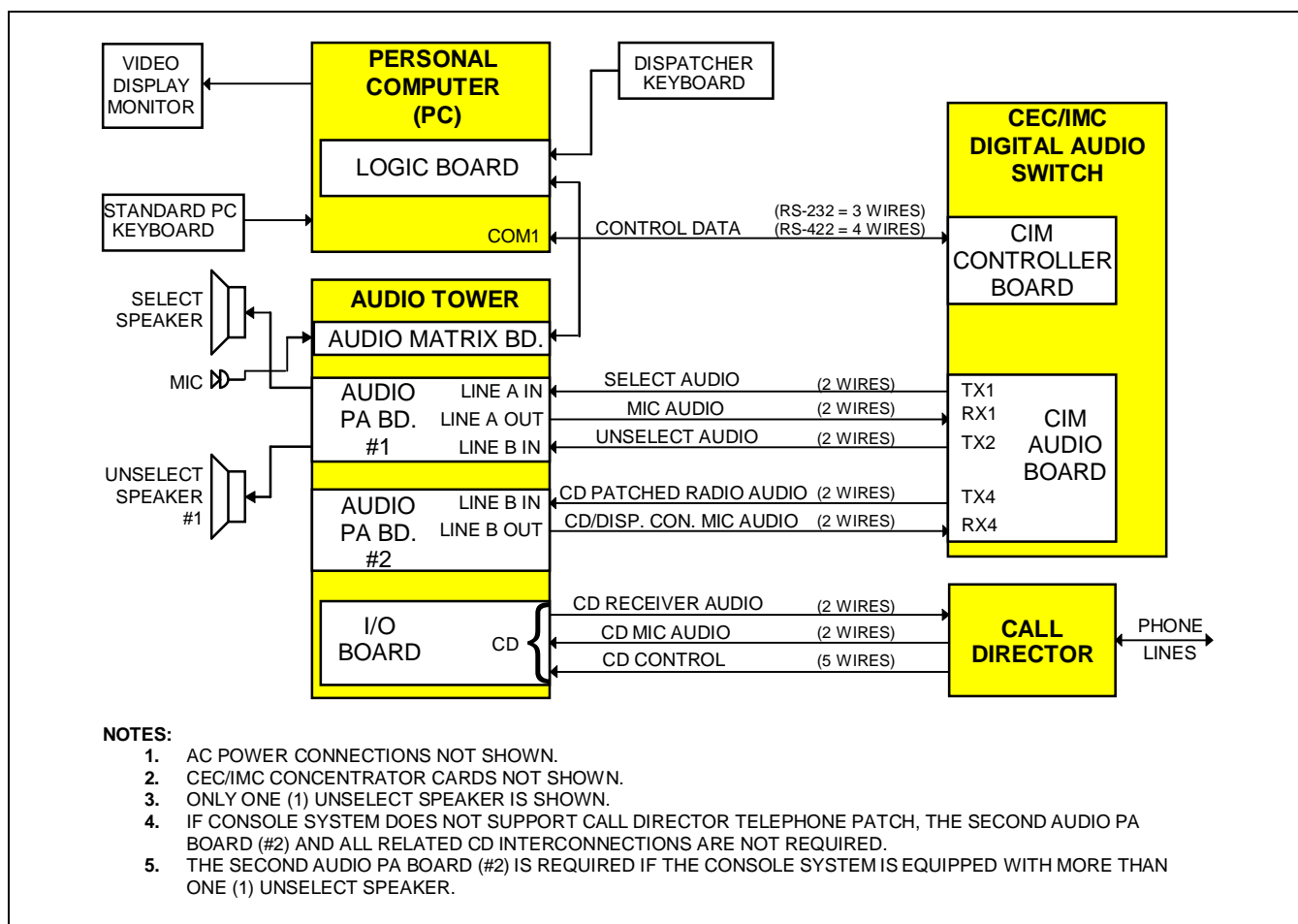


Figure 1 – C3 Maestro Equipment Interconnections

PERSONAL COMPUTERS

In most cases, the Personal Computer (PC) used with the C3 Maestro console is delivered with the Logic Board installed, its hard disk drive formatted and MS-DOS operating system software installed on the hard disk drive. The C3 Maestro application software is also installed on the drive.

Hardware

Table 1 lists the PCs approved for use with a C3 Maestro console system. Use of an unapproved computer will void the console system's warranty and support services. Subsequent to the printing of this manual, additional PCs not listed in the table may be approved.

TABLE 1 – APPROVED PERSONAL COMPUTERS FOR USE WITH THE C3 MAESTRO

MANUFACTURER	MODEL NO. OR TYPE
Hewlett-Packard	Vectra 25N
Hewlett-Packard	486SX/25
Data General	Dasher 386SX/16
Data General	Dasher 386SX/20
Data General*	386/25A
Compaq	386S

* Manufactured for Data General by Acer; all plastic case.

Operating System Software

The PC will have either MS-DOS version 3.3, 5.x or 6.x installed on its hard drive. MS-DOS 5.x or 6.x is preferred. All Data General and Hewlett-Packard computers ship from the factory with either MS-DOS 5.x or 6.x. *MS-DOS 4.x is not approved for use with the C3 Maestro console system.*

BOARD SET-UP

IMPORTANT NOTE

Unless otherwise noted, all procedures in this manual should be performed in the order presented.

LOGIC BOARD

Normally, the Logic Board is configured correctly and installed inside the PC before the C3 Maestro console system is delivered to the customer. The following information is presented for reference only.

DIP Switches

SW1 – Dual-Port Address DIP Switch

All positions of DIP switch SW1 on the Logic Board should be in the "ON" or "CLOSED" position. This sets the base address of the dual-port RAM chip on the board to D000:0000 (hex). SW1 switch should never be configured in any other way. Figure 2 shows the "0000" setting.

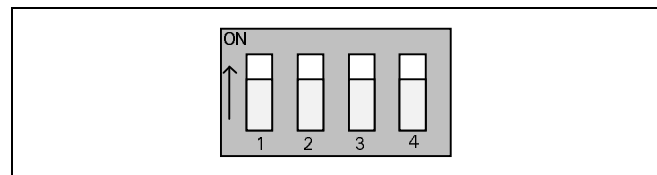


Figure 2 – Logic Board SW1 Factory Setting

SW2 – Interrupt (IRQ) DIP Switch

DIP switch SW2 on the Logic Board sets the board's interrupt request (IRQ) line. It should be set with position 1 "ON" or "CLOSED" and all other positions "OFF" or "OPEN". This sets the interrupt to seven (IRQ7). Normally, SW2 should not be configured in any other way. Figure 3 shows the setting. This setting is *not* a binary-code decimal equivalent representation of the interrupt number; the switch simply provides a single-pole four-throw switch function using four single-pole single-throw DIP switches.

Logic Boards previous to Rev. A were not equipped with SW2; the interrupt was hardwired as IRQ7.

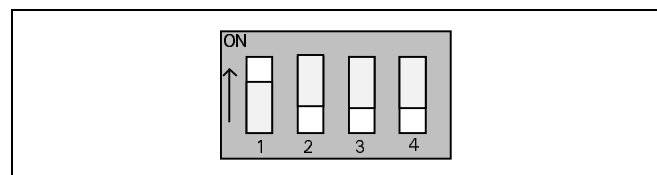


Figure 3 – Logic Board SW2 Factory Setting

Firmware

EPROM integrated circuit U4 on the Logic Board stores the operating program firmware for the on-board microprocessor. After programming at the factory, the EPROM (part number 344A4245Gx) is labeled with the corresponding firmware version number. C3 Maestro application software version 3.0x requires Logic Board firmware version 3.02 (part number 344A4245G10) or later. If necessary, verify the proper EPROM is installed into U4's socket.

Installation Into The PC

The Logic Board is installed in an expansion slot inside the PC. Although it can be installed in any slot, installing it in the slot furthest from the PC's internal power supply is recommended. If field installation is necessary, follow this procedure:

1. Review the procedures in the documentation included with the PC related to expansion board installation.
2. **If necessary, power-down the PC and disconnect it from the ac power source.**
3. Remove the outside cover from the PC in accordance with the manufacturer's instructions.
4. Select an empty expansion slot and remove the respective rear cover plate. Retain the hold-down screw. Discard the rear cover plate.
5. Install the Logic Board in the selected expansion slot. Secure it with the hold-down screw.
6. Replace the outside cover.

PLUG-IN RS-422 BOARD (Optional)

If the PC is equipped with a plug-in RS-422 capable board, see the section entitled **INTERCONNECTING THE EQUIPMENT**, subsection **"CEC/IMC INTERCONNECTIONS"** for set-up information.

AUDIO TOWER

All necessary slide-in boards are installed in the Audio Tower before the C3 Maestro console system ships from the factory. If the console system is ordered with multiple unselect speakers (2 or 3) or with the Call Director patch option, two Audio PA Boards are installed. DIP switches and jumpers/plugs located on the Audio Matrix and Audio PA Boards are factory configured for standard console installations. The following information lists the normal factory settings and the optional settings which are available.

Audio PA Board(s)

SW1 – Maximum Speaker Power Level DIP Switch

Switch SW1 on the Audio PA Board provides a method to limit the maximum audio output from each speaker power amplifier. Maximum levels of 5 watts or 8 watts are available. Normally, the factory setting is 5-watts. This level is recommended, as it should be adequate in nearly all dispatch environments. Table 2 indicates the available settings and Figure 4 shows the 5-watt factory setting. These switches have no effect on headset earphone output levels.

NOTE

SW1 is not present on Audio PA Board P29/5000055000. Both speaker power amplifiers on this earlier board (sometimes referred to as a "Phase 1" board) are hardwired for 8 watts maximum output. See LBI-38716 for details.

**TABLE 2 – AUDIO PA BOARD
MAX. SPEAKER POWER LEVEL SELECTION**

SW1 POSITION				MAXIMUM OUTPUT	
1	2	3	4	SPKR A	SPKR B
OFF	OFF	x	x	5 Watts	5 Watts
ON	OFF	x	x	8 Watts	5 Watts
OFF	ON	x	x	5 Watts	8 Watts
ON	ON	x	x	8 Watts	8 Watts

"x" = either position

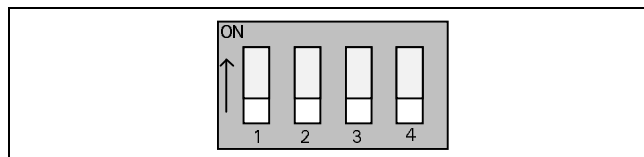


Figure 4 – Audio PA Board SW1 Factory Setting

SW2 – Audio Source DIP Switch

During normal console operations, SW2 positions 1 and 3 should always be "ON" or "CLOSED" and SW2 positions 2 and 4 should always be "OFF" or "OPEN". Figure 5 shows this setting.

For test procedures, SW2 positions 1 thru 4 may be inverted to shift the Speaker A and Speaker B audio

amplifiers' source audio from the Audio Matrix Board (normal) to Line A and Line B balanced inputs (test), respectively. See LBI-39064 for specific details. With this test setting, audio signals on the line inputs are applied directly to the speakers' power amplifiers without being routed through the Audio Matrix Board.

NOTE

SW2 is not present on Audio PA Board P29/5000055000. Audio source selection on this earlier board (sometimes referred to as a "Phase 1" board) is accomplished via two jumpers/plugs identified as JP1 and JP2. During normal (non-test) console operations, jumpers must be in between pins "A" and "C" on both plugs. These settings route Line A and Line B audio signals from the Audio PA Board to the Speaker A and Speaker B power amplifiers. See LBI-38716 for additional details.

TABLE 3 – AUDIO PA BOARD AUDIO SOURCE SELECTION

SW2 POSITION				SOURCE	OUTPUT
1	2	3	4		
ON	OFF	x	x	Matrix Bd.	Speaker A
OFF	ON	x	x	Line A In	Speaker A
x	x	ON	OFF	Matrix Bd.	Speaker B
x	x	OFF	ON	Line B In	Speaker B

"x" = either position

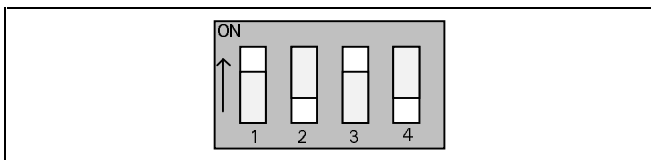


Figure 5 – Audio PA Board SW2 Factory Setting

Audio Matrix Board

SW1 – Mic Audio ALC Enable/Disable DIP Switch

DIP switch SW1 on the Audio Matrix Board is used to independently enable or disable each microphone's automatic level control (ALC) circuit. The switch has four (4) positions, one for each mic that may be connected to the board.

As shown in Figure 6, Audio Matrix Boards ship from the factory with all mic audio ALC circuits enabled. This is accomplished by setting all four SW1 switch positions to "ON" or "CLOSED". Table 4 lists each switch position and its corresponding mic input. Normally, mic audio ALC should not be disabled. Disable a mic's ALC by setting the corresponding DIP switch position to "OFF" or "OPEN".

TABLE 4 – AUDIO MATRIX BOARD MIC AUDIO ALC ENABLE/DISABLE

SW1 POSITION	MIC
1	Boom/Gooseneck
2	Desk
3	Operator Headset
4	Supervisor Headset

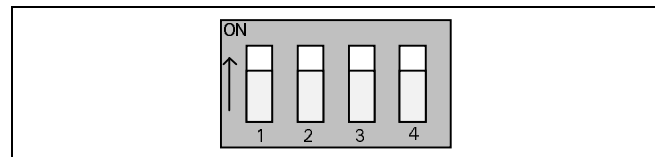


Figure 6 – Audio Matrix Board SW1 Factory Setting

I/O Board

No I/O Board configuration is necessary. Simply verify the Board is fully inserted into the far left-hand slot (as viewed from front).

INTERCONNECTING THE EQUIPMENT

A C3 Maestro dispatch console system requires the following interconnections:

- PC-to-CEC/IMC Data Concentrator Card (via punch blocks, if employed)
- Audio Tower-to-CEC/IMC Audio Concentrator Card (via punch blocks, if employed)
- PC-to-Audio Tower
- PC-to-Dispatcher Keyboard
- PC-to-Standard Keyboard (when in use)
- PC-to-Video Display Monitor
- Audio Tower-to-Desk Mic (if used)

- Audio Tower-to-Supervisor Headset Jack Box (if used)
- Audio Tower-to-Operator Headset Jack Box (if used)
- Audio Tower-to-Boom/Gooseneck Mic (if used)
- Audio Tower-to-Boom/Gooseneck PTT and Monitor Switches (if used)
- Audio Tower-to-Footswitches (if used)
- Audio Tower-to-Volume Controller Box (if used)
- Audio Tower-to-Speakers (if used)
- PC, Video Display Monitor and Audio Tower AC Power Connections

In addition, the following interconnections are required for optional equipment, if employed:

- Audio Tower-to-Recorder Equipment
- Audio Tower-to-Pager
- Audio Tower-to-External Equipment Controlled by Relay Form-A Contacts
- Audio Tower-to-Call Director

IMPORTANT NOTE

Unless otherwise noted, all procedures in this manual should be performed in the order presented.

CEC/IMC INTERCONNECTIONS

The C3 Maestro console interfaces to the CEC/IMC via a full-duplex serial control data link and a 4-wire audio connection. In addition, each unselect speaker requires an additional 2-wire connection from the CEC/IMC. Also, if the console is interfaced to a Call Director for Call Director telephone patch operations, an additional 4-wire audio link between the C3 Maestro and the CEC/IMC is required. See Figures 1 and 8. As shown in Figure 8, all CEC/IMC interconnections are made at Concentrator Cards. These cards are located at the back of the CEC/IMC cabinet.

CEC/IMC Concentrator Card pin-out details are listed on the customer-specific system documentation print-outs. These print-outs are included with the CEC/IMC when it ships from the factory. See the *CEC/IMC Digital Audio Switch Customer-Specific System Documentation*

maintenance manual, LBI-38939 for sample print-outs and complete print-out explanations.

Control Data Link

Either an RS-422 (four-wire) or an RS-232 (three-wire) serial control data link may be employed. RS-422 control data interfacing is recommended and in most all installations, it is used for co-located console interconnections. RS-232 has poorer noise performance than RS-422 and therefore, it should never be used for cable runs more than 50 feet in length.

If required for a remote console installation, full-duplex 4-wire data modems can be used between the C3 Maestro and the CEC/IMC. See the following subsection for additional remote console wiring and modem configuration details.

At the C3 Maestro, control data connections terminate at the PC's COM1 serial port. On the CEC/IMC side, the console's control data connections are made at a Data Concentrator Card. As shown in Figure 8A, punch blocks may be installed between the CEC/IMC and the console. Also shown in the figure, a Concentrator Card Cable interconnects the Data Concentrator Card to the CIM Controller Board via the CEC/IMC Backplane.

All Data General (DG) Dasher computers are factory equipped with a built-in COM1 serial port on the main board that can be wired for RS-422 or RS-232 operation. The connector is a DB-25 type. See Figure 8A.

Computers not equipped with a main board RS-422 capable COM1 port normally have a plug-in RS-422 board installed in an expansion slot. This board has a DB-25 connector at its rear plate. Approved RS-422 plug-in board model numbers include RS422AT-P, RS422I-P and 3PXOCC1A. An RS422x-x board (part number 344A3927P38) can easily be identified by the presence of two LED indicators visible on its rear plate. If a plug-in RS-422 board is used, the PC's main board COM1 port must be disabled. This is done via a DIP switch, jumper, or a BIOS set-up program. For COM1 port enable/disable configuration details, refer to the section entitled "**SOFTWARE INSTALLATION AND SET-UP PROCEDURE**", subsection "**PC CMOS SET-UP PROGRAM**" later in this manual, and the PC manufacturer's documentation.

Factory-installed RS422x-x (344A3927P38) or 3PXOCC1A plug-in boards are configured correctly before the PC ships from the factory. This configuration includes disabling the PC's main board COM1 port per manufacturer's instructions.

RS422x-x board configuration is:

Address Switches A3-A9	All On (RS422AT-P)
Address Switches A3-A9	All Off (RS422I-P)
Interrupt Jumper	IN4
LD GND Jumper	In
LD Jumper	In
DX Jumper	In
SX Jumper	Out
HDX Jumper	Out
FDX Jumper	In
SLOT 8 Jumper	Out (RS422AT-P)
-BIAS and +BIAS	Out (RS422I-P)

Configuration for the 3PXOCC1A board is:

Address Switches (S1)	All Off
Interrupt Jumper	IRQ4
Jumpers JP12 - JP15	Upper Position
Jumpers JP16 - JP17	Lower Position

If any other RS-422 plug-in serial board is used the following board configuration must be used:

COM Port	COM1
Port Address	3F8
Interrupt	IRQ4

See Figure 8A or the manufacturer's documentation for COM port connector pin-out details. Interconnect the control data connections between the PC and the appropriate CEC/IMC Data Concentrator Card as required. Shielded pairs are recommended.

Remote Console Interconnections Via A 4-Wire Modem

When the C3 Maestro is installed at a remote location from the CEC/IMC, serial control data must be routed via RS-232 connections and 4-wire modems. Since the C3 Maestro requires a dedicated or continuous serial link (non-dial-up), a 4-wire leased line (or equivalent) meeting 3002 data grade specifications must be employed between the CEC/IMC and the C3 Maestro in a remote console installation.

Figure 8B shows typical control data interconnections for a remote console installation using RS-232 connections and full-duplex 4-wire modems. At the CEC/IMC Data Concentrator Card, RS-232 connections are made at J13, *not* J12. **Observe all notes listed in the figure if wiring an installation of this type.** Recommended modem settings are:

- **Modem Options**

- DCE Rate = 9600
- Originate/Answer = Originate (CEC/IMC modem)
- Originate/Answer = Answer (C3 Maestro modem)
- V.32 Fast Train = Enabled
- Auto Retrain = Enabled
- Internal/External Clock = Internal
- Dial-Up/Leased Line = Leased
- 2-Wire/4-Wire = 4 Wire
- TX Level = (as required; use -15 dBm if line loss is 0 dB)
- Dial Backup = Manual
- Loop Back Time = 15 minutes
- Dial Line = RJ11
- Line Current Disconnect = Long
- Long Space Disconnect = Enabled
- V.22 Guard Tone = Disabled

- **MNP Options**

- MNP Protocol = Enabled
- Auto Fallback = Enabled (or Normal)
- Flow Control = CTS Only
- XON/XOFF Pass Through = Enabled
- Data Compression = Disabled
- Inactivity Timer = Off
- Break Control = 5

- **DTE Options**

- Synchronous/Asynchronous Data = Asynchronous
- DTE Rate = 9600
- Character Length = 8 Bits
- Parity = None
- Commanded Dialer = Asynchronous
- AT Command Set = Disabled
- DTR Control = Disabled
- DSR = Forced High
- DCD = Normal
- CTS = Forced High
- DTE Fallback = Disabled
- Options = Retained At Disconnect

- **Test Options** - All Disabled (or factory defaults)
- **Dial Line Options** - (not applicable; leave at factory defaults)
- **Speaker Options**
 Volume Control = Low
 Control = On Until Carrier Detect

Audio Links

Audio Concentrator Cards at the back of the CEC/IMC cabinet provide audio connections at the CEC/IMC. See the customer-specific system documentation print-outs for Concentrator Card connector pin-out details.

At the C3 Maestro, audio connections terminate at RJ-11 modular jacks on the Audio PA Board(s) in the Audio Tower. These jacks are labeled "LINE A" and "LINE B". Table 6 shows line requirements between the C3 Maestro and the CEC/IMC for each audio input or output 2-wire pair. Note that two (2) output pairs, Line B out on board #1 and Line A out on board #2, are never used. Table 5 gives the modular jack pin-outs and Figure 7 shows their locations. Interconnect the required pairs between the Audio PA Board(s) and the appropriate CEC/IMC Audio Concentrator Card. Shielded pairs are recommended.

TABLE 5 – CONSOLE-TO-CEC/IMC BALANCED LINE AUDIO INTERCONNECTIONS

STANDARD 6-POSITION 4-CONTACT RJ-11 PIN NUMBER *	AUDIO PA BOARD 6-POSITION 4-CONTACT RJ-11 PIN NUMBER	TO/FROM CEC/IMC
1	(none)	(n/a)
2	1	CIM Line Out
3	2	CIM Line In
4	3	CIM Line In
5	4	CIM Line Out
6	(none)	(n/a)

* RJ-11 pins 1 and 6 are not used.

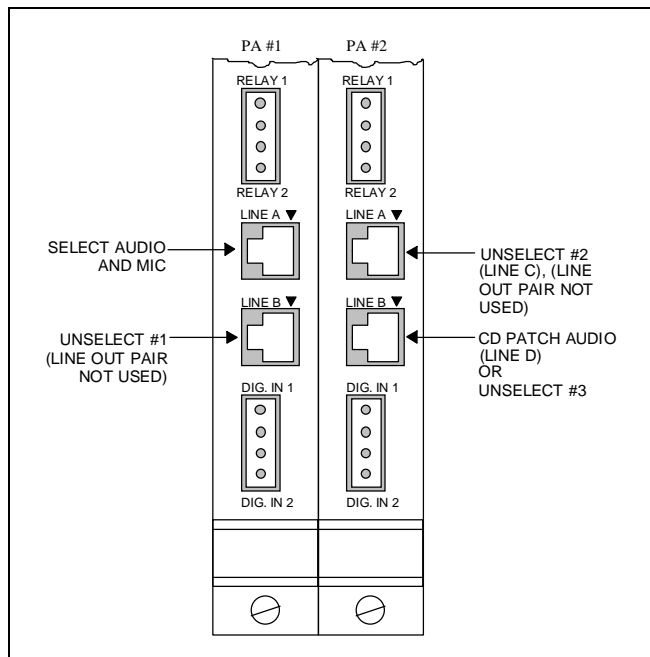


Figure 7 – Audio PA Boards' Modular Jacks

PERSONAL COMPUTER

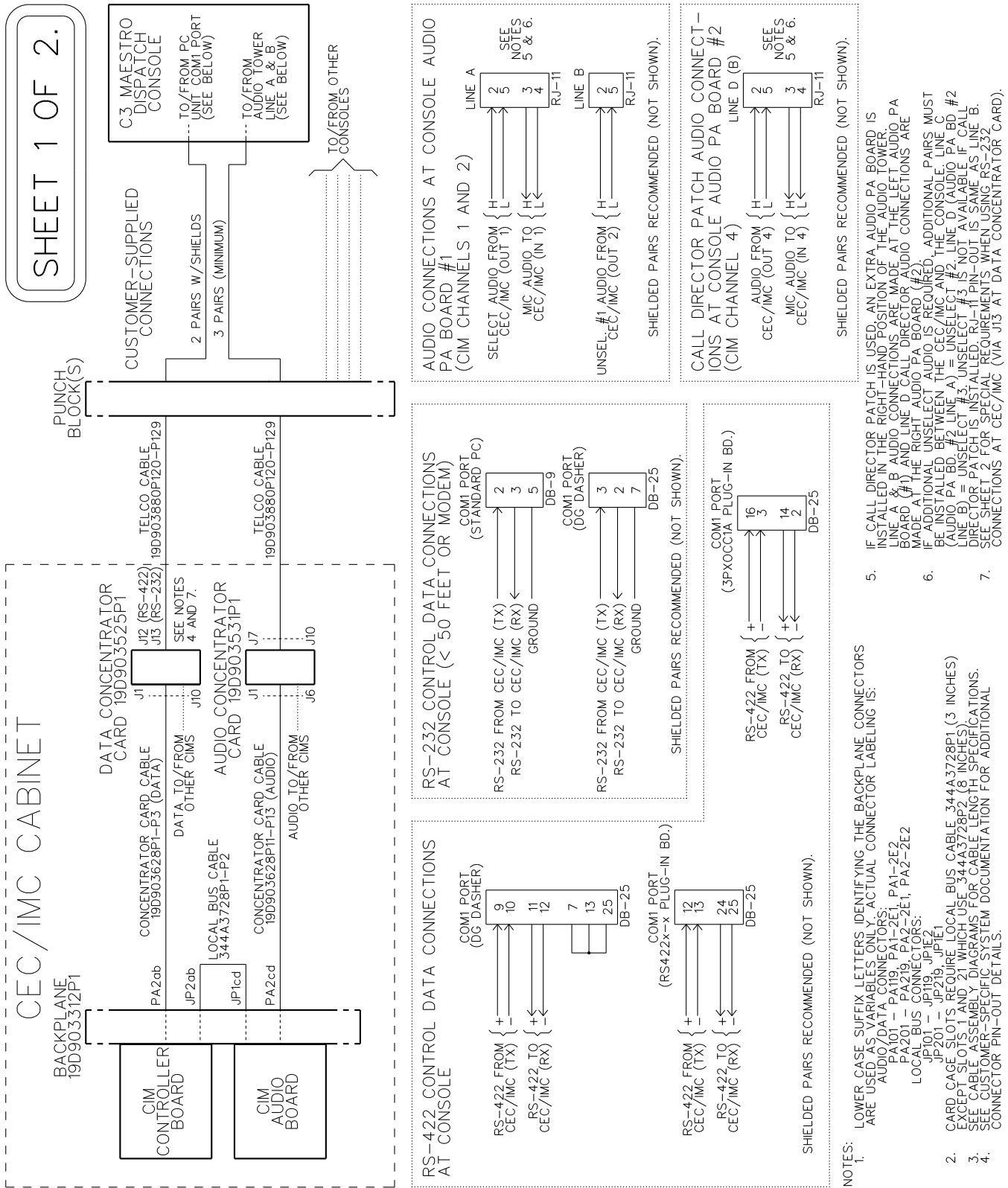
PC-To-Audio Tower Interconnect Cable

The PC-to-Audio Tower Interconnect Cable (part number P29/1030050000) must be connected between the PC and the Audio Tower. This cable has male DB-37 connectors on both ends with the connectors' pins wired in a straight-through pin-to-pin fashion - pin 1 to pin 1, pin 2 to pin 2, etc. The cable is ten (10) feet long and it should not be lengthened.

Mate one male DB-37 connector to the Logic Board and mate the other to the Audio Matrix Board's connector labeled "COMPUTER".

NOTE

Do not over-tighten the screws on the DB-style connectors.

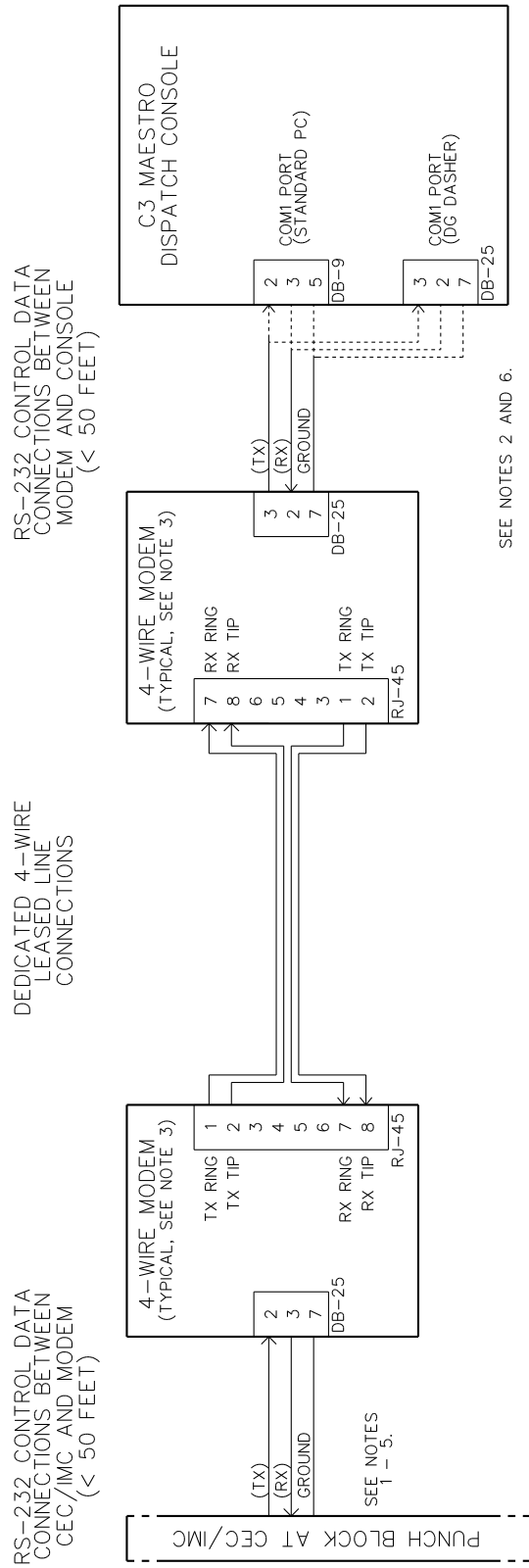


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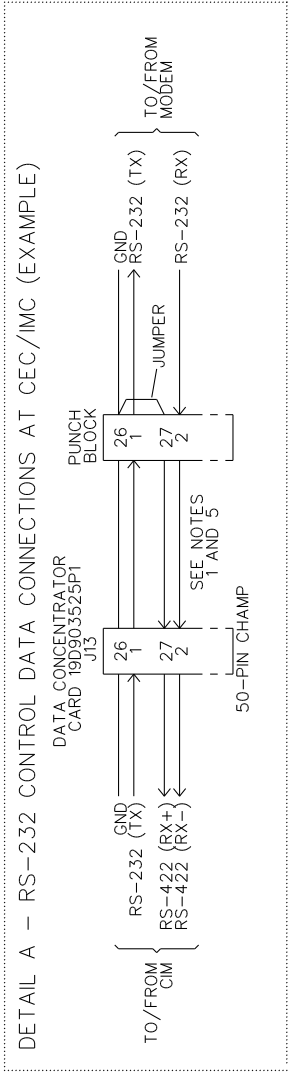
- LOWER CASE SUFFIX LETTERS IDENTIFYING THE BACKPLANE CONNECTORS ARE USED AS VARIABLES. ONLY ACTUAL CONNECTOR LABELING IS APPLIED TO DATA CONNECTORS.
- CARD CAGE SLOTS REQUIRE LOCAL BUS CABLE 344A3728P1 (3 INCHES) EXCEPT SLOTS 1 AND 21 WHICH USE 344A3728P2 (8 INCHES).
- SEE CABLE ASSEMBLY DIAGRAMS FOR CABLE LENGTH SPECIFICATIONS.
- SEE CUSTOMER-SPECIFIC SYSTEM DOCUMENTATION FOR ADDITIONAL CONNECTOR PIN-OUT DETAILS.

Figure 8A – CEC/IMC-To-C3 Maestro Interconnections (Co-Located)

SHEET 2 OF 2.



SEE NOTES 2 AND 6.



- NOTES:
1. SEE CUSTOMER-SPECIFIC SYSTEM DOCUMENTATION PRINT-OUTS FOR PUNCH BLOCK CONNECTOR PIN-OUT DETAILS.
 2. SHIELDED PAIRS RECOMMENDED (NOT SHOWN).
 3. SEE MODEM MANUFACTURER'S DOCUMENTATION FOR SPECIFIC CONNECTOR PIN-OUT DETAILS.
 4. RS-232 CONNECTIONS AT CEC/IMC REQUIRE A JUMPER (SHORT) BETWEEN GND AND RS-422 RX+ TERMINALS. SEE DETAIL "A" FOR EXAMPLE.
 5. DETAIL "A" PINS OUT FIRST CONSOLE ON PUNCH BLOCK ONLY. AUDIO CONNECTIONS NOT SHOWN.

Figure 8B – CEC/IMC-To-C3 Maestro Interconnections (Remote And/Or RS-232)

Dispatcher Keyboard

The dispatcher keyboard interfaces to the PC via circuitry on the Logic Board. Its part number is P29/7590182002 (344A3927P25). This keyboard is sometimes referred to as the "custom keyboard".

Connect the dispatcher keyboard to the PC by plugging its 4-pin interlocking plug to the round socket at the Logic Board's rear cover plate. If the Logic Board is vertically orientated, this socket is located just above the female DB-37 connector. When correctly mated, the red dot on the plug will be in a 3 o'clock or 9 o'clock position if the Logic Board is vertically orientated.

If disconnection is necessary, pull on the sleeve and not on the cable. Pulling on the cable will not free the latch and may damage the cable if excessive force is used.

Standard PC Keyboard

During dispatch operations, the standard PC keyboard is not used. However, during the console set-up process, access to this keyboard will be required:

- for file management (for example - AUTOEXEC.BAT and CONFIG.SYS file changes may be necessary)
- to configure certain items via the Editor program

(see LBI-39056 for details)

- to start and operate the CTEST test program
- to start the console's application program

Connect the standard PC keyboard to the PC in accordance with the manufacturer's instructions.

Video Display Monitor

Interconnect the video display monitor's video cable to the Personal Computer in accordance with the manufacturer's instructions.

AUDIO TOWER

All Audio Tower-related cables should be routed out of the bottom of the case through the cut-out in the bottom of the rear door. If necessary, some or all of the cables can be routed under the case's stand and out to the front of the Audio Tower. Secure the cables with cable ties as necessary.

Desk Mic (if used)

Connect the desk microphone (option CRMC3D or equivalent) to the Audio Tower by mating its male DB-9 connector to the female DB-9 connector labeled "DESK

TABLE 6 – C3 MAESTRO-TO-CEC/IMC AUDIO LINE REQUIREMENTS

AUDIO MATRIX BOARD LABELING	AUDIO PA BOARD #1				AUDIO PA BOARD #2			
	LINE A	LINE B	LINE A	LINE B	LINE A	LINE B	LINE A	LINE B
C3 MAESTRO DESIGNATION	LINE A	LINE B	LINE C	LINE D				
CEC/IMC DESIGNATION	LINE 1	LINE 2	LINE 3	LINE 4				
CONSOLE	IN	OUT	IN	OUT	IN	OUT	IN	OUT
CEC/IMC	OUT	IN	OUT	IN	OUT	IN	OUT	IN
SELECT SPEAKER/HEADSET	X							
MICROPHONE		X						
UNSELECT SPEAKER #1			XX					
UNSELECT SPEAKER #2					XX			
UNSELECT SPEAKER #3 *							XX	
CALL DIRECTOR PATCH							XX	XX

"X" = 2-wire connection always required

"XX" = 2-wire connection required if console is so equipped

* = Unselect speaker #3 not available if console is equipped with Call Director patch

MIC" on the Audio Matrix Board. The desk mic's cable is five (5) feet long.

"BOOM/GOOSE MIC" on the Audio Matrix Board. Cable length is four (4) feet.

NOTE

Do not over-tighten the screws on the DB-style connectors.

CAUTION !

DO NOT connect a boom or gooseneck microphone to one of the other DB-9 microphone connectors on the Audio Matrix Board. Damage to the boom/gooseneck mic's magnetic voice coil may occur.

Headset Jacks (if used)

At the selected location, secure each headset jack box (part of option CRCN1W or equivalent) to the mounting surface using the four (4) #10 thread-forming screws supplied in the installation kit. Before mounting, verify adequate clearance is maintained for the headset's plugs. If using both jack boxes, label them "SUPERVISOR" and "OPERATOR".

Connect the headset jack boxes to the Audio Tower using the 6-foot cable supplied. This cable (part number 19C337102P1 supplied with CRCN1W) has male DB-9 connectors on both ends. One end mates with the female DB-9 connector at a headset jack box and the other end mates to the female DB-9 connector at the Audio Matrix Board. Headset connectors at the Audio Matrix Board are labeled "SUPERVISOR HEADSET" and "OPERATOR HEADSET". Interconnect the cables accordingly.

TABLE 7 – BOOM/GOOSENECK MIC WIRING*

WIRE COLOR	DB-9 PIN NUMBER
Black	9
White	5
Shield	1

* Also see the following NOTE.

NOTE

All boom and gooseneck mic connectors (male DB-9) must have pins 2 and 3 jumpered together so the sense circuit will be active when the mic is connected to the Audio Matrix Board.

NOTE

Microphone priority is (highest to lowest):

- Supervisory Headset Mic
- Operator Headset Mic
- Boom/Gooseneck Mic
- Desk Mic

The boom/gooseneck mic has priority over the desk mic when no headset is plugged into the Audio Tower. Desk mic PTTs will be ignored if a headset is connected to the Audio Tower.

Boom/Gooseneck PTT and Monitor Switches (if used)

Boom/Gooseneck PTT and monitor switch input connections are located at the terminal block labeled "B/G PTT" and "MON PTT" on the I/O Board. Each input is wired in parallel at the following points and thus may be activated from any one of several locations. See the schematic in the appropriate board's maintenance manual for specific connector pin-out details:

- B/G PTT input is located at the "B/G PTT" & "MON PTT" terminal block on the I/O Board, at the "FOOTSWITCH 2" female DB-9 connector on the I/O Board, and at the "BOOM/GOOSE MIC" female DB-9 connector on the Audio Matrix Board.

Boom/Gooseneck Mic (if used)

A boom microphone (option CRMC3E or equivalent) or a gooseneck microphone (option CRMC3F or equivalent) may be connected to the Audio Tower. Mount the microphone in accordance with the instructions supplied. With the gooseneck microphone, the supplied male DB-9 connector must be soldered to the cable in accordance with Table 7. Connect the boom/gooseneck male DB-9 connector to the female DB-9 connector labeled

- Monitor switch input is located at the "B/G PTT" & "MON PTT" terminal block on the I/O Board, at the "FOOTSWITCH 1" female DB-9 connector on the I/O Board, at the "FOOTSWITCH 2" female DB-9 connector on the I/O Board, and at the "DESK MIC" female DB-9 connector on the Audio Matrix Board.

Using Figure 9 as a terminal guide, connect the switches to the screw terminals. Each switch should be a momentary-contact normally-open type. The ground connections are common.

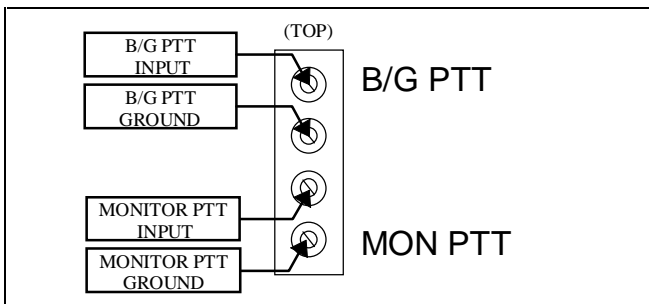


Figure 9 – I/O Board Boom/Gooseneck PTT and Monitor Terminal Block Pin-Out

Footswitches (if used)

Two (2) female DB-9 connectors are located on the I/O Board for footswitch interconnections. "FOOTSWITCH 1" keys the desk mic and "FOOTSWITCH 2" keys the headset and boom/gooseneck mics. Footswitches used with the C3 Maestro dispatch console include single-footswitch option CRSU3B and dual-footswitch option CRSU3C. On the dual-footswitch, one switch keys the mic and the other switch is a monitor switch. Each input is wired in parallel at the following points and thus may be activated from any one of several locations. See the schematic in the appropriate board's maintenance manual for specific connector pin-out details.

- B/G PTT input is located at the 'B/G PTT' & "MON PTT" terminal block on the I/O Board, at the "FOOTSWITCH 2" female DB-9 connector on the I/O Board, and at the 'BOOM/GOOSE MIC' female DB-9 connector on the Audio Matrix Board.
- Monitor switch input is located at the "B/G PTT" & "MON PTT" terminal block on the I/O Board, at the "FOOTSWITCH 1" female DB-9 connector on the I/O Board, at the "FOOTSWITCH 2" female DB-9 connector on the I/O Board, and at the "DESK MIC" female DB-9 connector on the Audio Matrix Board.

- Desk mic PTT is located at the "FOOTSWITCH 1" female DB-9 connector on the I/O Board and at the "DESK MIC" female DB-9 connector on the Audio Matrix Board.

All footswitch cables terminate with male DB-9 connectors. Mate the appropriate male DB-9 footswitch connector to the respective female DB-9 connector on the I/O Board.

Volume Controller Box (if used)

If the console system is equipped with speakers, the Volume Controller Box must be used. Typically, it is located under the video display monitor but it may be placed at any convenient location within cable reach of the Audio Tower. The supplied cable is ten (10) feet in length.

The cable used with the Volume Controller Box has male DB-15 connectors on both ends. Its part number is P29/1030049000. Mate one end of this cable to the DB-15 connector at the back of the Volume Controller Box. Mate the other end to the female DB-15 connector labeled "VOLUME CONTROLLER" at the bottom of the Audio Tower's rear panel. This connector is located on the Spreader Board.

Each Audio PA Board installed in the Audio Tower that has speakers connected to it must have a "jumper" cable connected between its "VOLUME CONTROLLER" DB-9 connector and the Spreader Board. The "jumper" cable's part number is P29/1030048000. If the second Audio PA Board (#2) is used only for Call Director interfacing, it will not have any speaker connections and it will therefore not require a "jumper" cable.

Only one "jumper" cable is required for a 2-speaker console. A 3- or 4-speaker console which is equipped with two Audio PA Boards requires two "jumper" cables. Connect a "jumper" cable between the first Audio PA Board's connector labeled "VOLUME CONTROLLER" and the connector labeled "A" on the Spreader Board. The first Audio PA Board (#1) is located in the slot adjacent to the Audio Matrix Board. If the console system has 3- or 4-speakers, connect a second "jumper" cable between the second Audio PA Board's connector labeled "VOLUME CONTROLLER" and the connector labeled "B" on the Spreader Board. The second Audio PA Board (#2) is located in the Audio Tower's far right-hand slot as viewed from the back of the Audio Tower.

Speakers (if used)

Mount the speakers in a suitable location. Connect the leads from each speaker to the terminal block's screw terminals on the Audio PA Board as specified in Table 8.

These terminals are not polarity sensitive. Load resistors are not required for unused speaker outputs.

TABLE 8 – SPEAKER CONNECTIONS

SPEAKER	AUDIO PA BOARD	TERMINAL BLOCK LABELING	SCREW TERMINALS
Select	#1 *	SPKR A	upper two
Unselect #1	#1 *	SPKR B	lower two
Unselect #2	#2 *	SPKR A	upper two
Unselect #3	#2 *	SPKR B	lower two

* Audio PA Board #1 is the board in the slot adjacent to the Audio Matrix Board. Audio PA Board #2 is the board in the far right-hand slot as viewed from the back of the Audio Tower.

CAUTION !

THE SPEAKER LEADS CANNOT BE CONNECTED TO GROUND. Connecting a speaker lead to ground will short-circuit the speaker power amplifier and reduce output power considerably. Speaker damage may also occur. These terminals are intentionally not labeled with polarity to help prevent any of the terminals from being connected to ground or to another amplifier.

Recorder Outputs (if used)

To provide call-check recorder support, select and unselect audio outputs are available from the Audio Tower. These 600-ohm outputs appear at the top terminal block on the I/O Board. Unselect audio appears on the two terminals labeled "UNSELECT RECORDER" and select audio appears on the two terminals labeled "SELECT RECORDER". Interconnect the outputs to call-check recorders as required. These outputs *are not* isolated from ground through isolation transformers and the two ground terminals are common. See the specifications page in LBI-39062 for audio signal output level specifications.

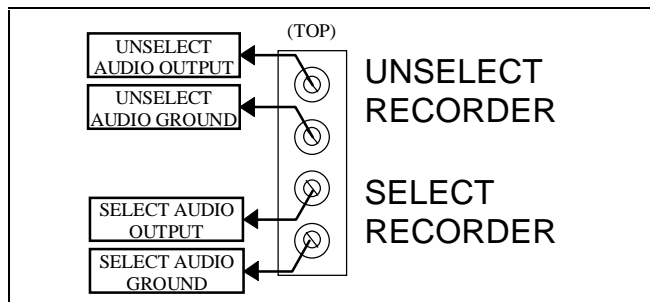


Figure 10 – I/O Board Recorder Terminal Block Pin-Out

Pager Input (if used)

Pager connections are also located on a terminal block on the I/O Board. A 600-ohm audio input and a PTT (page enable) input are included. The terminals are labeled "PAGE INPUT" and "PAGE PTT" respectively.

Pager audio on "PAGE INPUT" is switched in when "PAGE PTT" becomes active. "PAGE PTT" is active when its two terminals are shorted together by a relay contact (or equivalent) in the pager. During a page, no other audio signals are applied to the Line A output. Also, the paging signal is sent to the headsets and speakers approximately 16 dB lower than other audio signal levels.

Connect the pager to the terminal block in accordance with the manufacturer's instructions. As shown in Figure 11, the two (2) upper terminals on the terminal block are the "PAGE INPUT" connections and the two lower terminals are the "PAGE PTT" connections. These inputs *are not* isolated from ground and the ground terminals are common. See the specifications page in LBI-39062 for audio signal input level specifications.

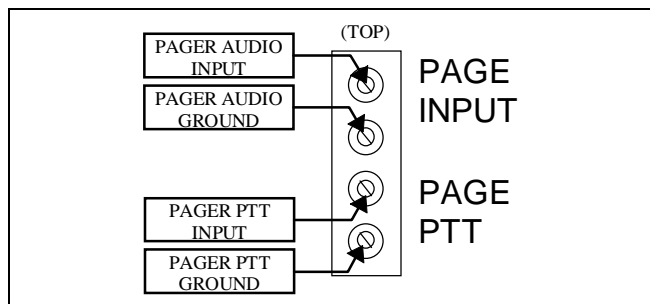


Figure 11 – I/O Board Pager Terminal Block Pin-Out

Relay Outputs (if used)

Form-A relay contacts (SPST normally-open) are available from the Audio Tower for external device control. All relay contact connections are made at the screw-terminal type terminal blocks on the I/O Board and Audio

PA Board(s). See Table 9 for details. All relay connections are isolated from ground.

"RELAY 1" contacts at the I/O Board close when the console is keyed (PTT'd). Audio PA Board #1 "RELAY 1" contacts toggle open/closed at an <Alt><F9> keystroke from the dispatcher keyboard and the RELAY 2 contacts close (momentarily action) while <Alt><F10> is depressed at the dispatcher keyboard. The other relays are not supported by software.

TABLE 9 – RELAY CONNECTIONS

BOARD	TERMINAL BLOCK LABELING	SCREW TERMINALS	ACTIVATION METHOD
I/O	RELAY 1	upper two	console PTT
I/O	RELAY 2	lower two	not supported
Audio PA #1	RELAY 1	upper two	<Alt><F9>
Audio PA #1	RELAY 2	lower two	<Alt><F10>
Audio PA #2	RELAY 1	upper two	not supported
Audio PA #2	RELAY 2	lower two	not supported

Call Director (if equipped)

As shown in Figure 1, all C3 Maestro-to-Call Director interconnections at the console are made at the Audio Tower's I/O Board. Call Director telephone patch also requires a second Audio PA Board (#2) in the Audio Tower and a 4-wire balanced line between this board and the console's CIM within the CEC/IMC. At the CEC/IMC, CIM audio channel/line four (4) is used for Call Director interfacing. CD control data interfacing is handled over the existing RS-232/RS-422 serial control data interface between the PC and the CEC/IMC. Refer to Figures 1, 7, 8 and 12 for Call Director interconnection details.

Console-to-CEC/IMC Audio Interconnections

All audio in to and out of a C3 Maestro dispatch console system enters and leaves the console via modular jacks on the Audio PA Boards. Both Audio PA Boards have the same "LINE A" and "LINE B" labeling at the modular jacks. As shown in Table 6, "LINE A" and "LINE B" labels on the second Audio PA Board (#2) are considered LINE C and LINE D respectively. Figure 7 shows modular jack locations. LINE C, if used for a second unselect speaker, connects to CEC/IMC CIM channel/line 3. Call Director LINE D connects to CEC/IMC CIM channel/line 4.

NOTE

Refer to LBI-38715 if the C3 Maestro console system is equipped with "Phase 1" Audio Matrix, Audio PA, I/O or Backplane Boards. All "Phase 1" boards have P29/500000xx00x part numbers and all "Phase 2" boards have P29/772xxxxxxx part numbers. When using any "Phase 1" board, external CD interface transformers and other special modifications are required for Call Director interfacing.

Install a 4-wire balanced line (two pairs) between the required CEC/IMC Audio Concentrator Card and Audio PA Board #2 in the Audio Tower. See the prior section entitled "**CEC/IMC INTERCONNECTIONS**" for additional details on the Audio Concentrator Card pin-outs. Terminate the Audio PA Board's LINE D with an RJ-11 modular plug. RJ-11 pin-outs are shown in Table 5. Shielded cable is recommended.

Table 10 describes the audio signals between the Audio Tower's Audio PA Board #2 and the CIM within the CEC/IMC. The descriptions are relative to the Audio Tower. All audio signals on these 600-ohm pairs have typical levels of 0 dBm.

Console-to-Call Director Interconnections

Table 11 describes the various signals between the Audio Tower's I/O Board and the Call Director. The descriptions are relative to the Audio Tower. All I/O Board connections are made at the "CALL DIRECTOR" female DB-9 connector. Figure 12 shows the connector's pin-out.

EQUIPMENT ROOM GROUNDING

Proper grounding techniques should be observed in order to protect the equipment and service personnel from lightning and other sources of electrical surges. All consoles should be connected to properly grounded 3-terminal outlets. If used, lightning arrestors, UPS equipment, and all other console-associated equipment should also be properly grounded.

TABLE 10 – AUDIO PA BOARD #2-TO-CEC/IMC SIGNAL DESCRIPTIONS

TYPE	INPUT OR OUTPUT	USE
Patched Radio	Input	Radio audio from CIM TX channel 4. This audio is heard at the telephone.
CD/Operator Mic	Output	Telephone/operator mic audio to CIM RX channel 4. This audio is heard at the radio.

TABLE 11 – I/O BOARD-TO-CALL DIRECTOR SIGNAL DESCRIPTIONS

TYPE	INPUT OR OUTPUT	USE
On-Hook Relay (optional)	Output	Normally-open relay contact (Form-A). Closure generated when the console disconnects the CD from the CEC/IMC. Used to put CD on-hook, if an input exists. The relay remains energized for approximately 1.2 seconds. This value is fixed in the Logic Board firmware and cannot be changed. Relay contact ratings: 0.6 A @ 125 Vac 0.6 A @ 110 Vdc 2.0 A @ 30 Vdc
Handset Jack Sense (optional) *	Input	Active low when a handset is plugged into the CD. This handset overrides all audio connections to the Audio Tower. The operator talks directly to the phone via the handset instead of using the console's headset or mic/speaker. Dry contact.
Off-Hook Sense *	Input	Active low when the CD is placed off-hook. Dry contact.
Ground *	n/a	Signal ground for dry contact handset jack and off-hook sense lines.
CD Mic	Input	Audio from the CD (telephone mic). This audio is heard by a radio in patch operation, or by operator headset in normal operation. 600-ohm balanced input: -37 dBm to +8 dBm, typically -25 dBm.
CD Receiver	Output	Radio/operator mic audio to the CD (telephone receiver). This audio is heard by the telephone. 600-ohm balanced output: -20 dBm to 0 dBm, typically -5 dBm.

* Ground (pin 4) is common for Handset Jack Sense (pin 2) and Off-Hook Sense (pin 3). This ground *is not* isolated from chassis ground.

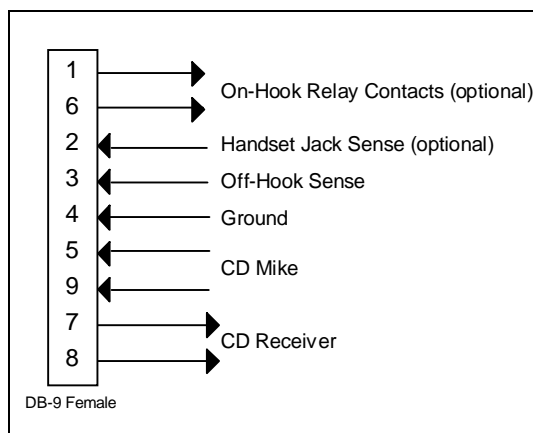


Figure 12 – I/O Board CALL DIRECTOR Pin-Out

AC POWER AND UPS EQUIPMENT

All consoles require 120 or 230 Vac (47 to 63 Hz) power sources. As a minimum, each outlet should be circuit-breaker protected per local building codes.

UPS protection is optional. Maximum required UPS wattage rating for a single console system should be based on the required maximum sums of the Audio Tower (200 watts max.), the PC's computer (per manufacturer's specifications) and the PC's video display monitor (per manufacturer's specifications).

POWER-UP PROCEDURE

The following C3 Maestro power-up procedure is recommended:

1. If the PC and/or monitor are equipped with a voltage selector switch, verify the switches are positioned correctly. The power supply within the Audio Tower automatically switches itself and therefore no voltage selection switch exists.
2. Verify all power switches are in the off position.
3. Connect the PC, video display monitor and the Audio Tower to a 120 or 230 Vac source. Some computers are equipped with a receptacle on their rear panel for the monitor's ac power connection. Refer to the PC and monitor documentation as necessary. Extension cords should *not* be used with the C3 Maestro console system.
4. Verify all equipment is properly grounded.
5. Power-up the Audio Tower.
6. Power-up the PC and its monitor.
7. Continue with the software installation and set-up procedures that follow.

SOFTWARE INSTALLATION AND SET-UP PROCEDURE

IMPORTANT NOTE

Unless otherwise noted, all procedures in this manual should be performed in the order presented.

PC CMOS SET-UP PROGRAM

C3 Maestro software is factory-installed on the PC's hard disk drive and the software is configured properly for standard installations. Therefore, during a typical console configuration, the information in this section may be bypassed.

All PCs used with the C3 Maestro store start-up configurations in CMOS memory. This information is read by the computer's BIOS and it may be changed by executing a set-up program during the PC's boot process. Execute the PC's set-up program only if a built-in (main board) COM1 port must be disabled/enabled or if documentation included with the PC deems it necessary for some other reason.

NOTE

Time and date will be correctly set by the CEC/IMC Manager (MOM PC) when the console is on-line with the CEC/IMC.

Hewlett-Packard Vectra 25N & 486SX/25

Typically, the set-up program is started by pressing <F2> when prompted with "For Setup press F2 now" during the boot process. COM1 is disabled by setting "Serial Ports/Port A" to "Off". An HP 486SX/25 computer should also have its "Serial Port B" set to "COM2 2F8H INT3". Be sure to save the change(s) before rebooting/resetting (typically via pressing <F3>).

Data General Dasher 386SX

This PC's set-up program is started by pressing <Ctrl><Alt><Ins> during the boot process. There is no need to disable COM1 since the built-in port supports both RS-422 and RS-232.

Experience has shown these computers can lose their CMOS settings on rare occasions during power-ups. Therefore, the following configuration information is presented:

Hard Disk 1:	Type 17
Base Memory:	640 KB
Extended Memory:	1408 MB
Board Memory:	640 KB
Memory Relocation:	Enabled

The Logic Board will not function properly if the "Memory Relocation" setting is disabled.

Data General 386SX/25A (Acer)

The set-up program is started by pressing <Ctrl><Alt><Esc> during the boot process. COM1 is disabled by selecting the "System Security Setup" and then setting "Serial Port1 Control" to "[Disable]". Press <Esc> twice to save the change and reboot.

Compaq 386S

This PC's set-up program is not used to disable the built-in COM1 port. Instead, COM1 is disabled by setting the main board's DIP switch SW2 positions 4 and 5 both "ON". Refer to the PC's documentation for additional details.

SOFTWARE INSTALLATION AND UPGRADES

As previously stated, all C3 Maestro application software is installed on the PC's hard disk drive at the factory. Refer to Ericsson GE document SRN-1000-xx which is included with a software upgrade package if a re-installation or an upgrade is necessary.

FILE DIRECTORIES AND CONTENTS

Table 12 specifies PC file directories and files directly applicable to the C3 Maestro console. The MS-DOS file directory and its files are not shown. Also, other utility files not listed in the table may exist in the utility directory which are not essential to the operation of the C3 Maestro application program.

**TABLE 12 - C3 MAESTRO
PC FILE DIRECTORIES AND FILES**

ROOT DIRECTORY (C:\)	CONSOLE DIRECTORY (C:\CONSOLE)	UTILITY DIRECTORY (C:\UTIL)
AUTOEXEC.BAT CONFIG.SYS COMMAND.COM* IO.SYS* MSDOS.SYS*	AUXIO.DAT CONFIG.DAT CONKEY.COM CONSOLE.EXE EDITOR.EXE ENGLISH.DAT ENTITY.DAT FONT33.DAT NORWEGAN.DAT PHONE.DAT SETUPS.DAT	CTEST.EXE

* MS-DOS V3.3 or greater. IO.SYS and MSDOS.SYS are hidden files.

AUTOEXEC.BAT File Contents

Contents of the AUTOEXEC.BAT file located in the root directory (C:\) are as follows. Changes are not recommended:

```
@ECHO OFF
PATH=C:\DOS;C:\UTIL
PROMPT $P$G
CD\CONSOLE
CONKEY
CONSOLE
```

CONFIG.SYS File Contents

Contents of the CONFIG.SYS file located in the root directory (C:\) are as follows. Changes are not recommended:

```
FILES=20
BUFFERS=40
DEVICE=C:\DOS\ANSI.SYS
```

NOTE

Earlier consoles used a "BUFFERS=25" setting.

EDITOR PROGRAM

If necessary, the Editor program (EDITOR.EXE) can be used to change one or more of the following parameters (non-inclusive list):

- Logic Board Interrupt (IRQ)
- COM1 Serial Port Baud Rate
- Set-Up Titles
- Call Director ID
- Boom/Gooseneck Mic Presence (version 2.x and previous only)

Except for the Call Director ID parameter, these parameters cannot be changed via the CEC/IMC Manager (MOM PC).

NOTE

CEC/IMC Manager (MOM PC) version 2.x (and earlier) also did not provide support for Call Director ID; this parameter also had to be set via the Editor program.

Most console-related configuration parameters should be changed at the CEC/IMC Manager and sent to the console. Users of the Editor program must understand the CEC/IMC Manager should be the central point of databasing and configuration for all C3 Maestro consoles connected to the CEC/IMC Digital Audio Switch. Changes made locally via the Editor program will override settings previously made via the CEC/IMC Manager. Correspondingly, changes made via the CEC/IMC Manager will override settings previously made via the Editor program.

At the PC's standard keyboard, execute the Editor program by typing EDITOR followed by an <Enter> from an MS-DOS prompt. The current directory must be C:\CONSOLE. See the LBI-39056 for additional details on the use of the Editor program.

Logic Board Interrupt (IRQ)

The Logic Board's interrupt software configuration must match the interrupt number set by DIP switch SW2 (hardware configuration) on the Logic Board. Refer to the previous DIP switch configuration information in this manual and LBI-39056 for details.

If necessary, use the Editor program to set the interrupt as required and save the change to the hard disk drive. Most all systems will use interrupt 7 (IRQ7). This is the factory (default) setting.

COM1 Serial Port Baud Rate

In C3 Maestro console systems, the baud rate of the COM1 serial port can operate at 19,200 or 9600 baud. The 19,200 setting is recommended. 9600 baud may be required when a data modem is employed between the console and the CEC/IMC.

If necessary, use the Editor program to change the baud rate. Save the change to the hard disk drive. 19,200 baud is the factory (default) setting. See LBI-39056 for additional details.

Set-Up Titles

From the Editor program's "USER PROFILE DATA" screen, enter the titles as required. These titles are displayed on the C3 Maestro's "Change Setup" notecards. Ten (10) titles, each with thirty-one (31) alphanumeric characters, are available. See LBI-39056 for additional details.

Call Director ID

Call Director ID is a secondary console ID number that is only used for Call Director telephone patch operations.

The default value for this ID is zero (0) – no Call Director. Valid Call Director ID range is 1 - 16382. The zero setting should not be changed unless a Call Director is attached to the console and the console will be used for Call Director patch operations. The ID resides in the unit/console ID space and it should therefore be a unique (unused) ID number. *Console ID and Call Director ID should **never** be identical.*

If using CEC/IMC firmware version 2.x (and earlier), set the Call Director ID number from the Editor program's "CONFIGURATION DATA" form. Save changes to the hard disk drive. See LBI-39056 for complete details.

If using CEC/IMC firmware version 3.x (and later) the Call Director ID setting should be made via the CEC/IMC Manager's "Console Hardware Configuration" option and then sent to the console.

Boom/Gooseneck Microphone Presence

C3 Maestro firmware/software version 2.x required the Editor program to manually set the presence/absence of a boom/gooseneck microphone. However, firmware/software version 3.x and Logic Board Rev. B hardware automatically sense the presence of a boom/gooseneck microphone via a hardware line from the BOOM/GOOSE MIC connector. Therefore, this item was removed from the Editor program version 3.x, as it is no longer required. If using firmware/software version 2.x, set this option using Editor program version 2.x as required.

NOTE

All boom and gooseneck mic connectors (male DB-9) must have pins 2 and 3 jumpered together so the sense circuit will be active when the mic is connected to the Audio Matrix Board.

RUNNING THE C3 MAESTRO APPLICATION PROGRAM

The C3 Maestro application program will automatically start when the PC is powered up via the CONSOLE(.EXE) statement in the AUTOEXEC.BAT file. After exiting the program, restart it again from the PC's standard keyboard by typing CONSOLE followed by an <Enter> at the MS-DOS prompt. The current directory must be C:\CONSOLE. In addition, the CONKEY.COM program which is also run via the AUTOEXEC.BAT file at boot-up, allows the C3 application program to be quickly restarted by simply pressing function key <F10>. In a new console installation, after starting the program, databases

must be initialized as described in the following section before dispatch operations can be performed.

DATABASE INITIALIZATION

When the console initializes from a cold start, all of the following sections should be performed to insure proper operation. All console databases are initialized via commands from the CEC/IMC Manager (MOM PC). See the *CEC/IMC Manager operations guide* LBI-38911 (version 2.x) or LBI-39024 (version 3.x) for additional details.

Basically, except for sending console configurations, all procedures presented in this section assume all CEC/IMC console configurations are complete as described in the *CEC/IMC Digital Audio Switch Installation, Set-Up And Troubleshooting* maintenance manual, LBI-38938. See "**STEP 6 - CONSOLE CONFIGURATION**" in LBI-38938 for details.

Console User Profile Configuration

From the CEC/IMC Manager, user profile data is sent only to the targeted console. When a target console receives user profile data from the CEC/IMC Manager it will send an acknowledgment to the CEC/IMC Manager. Send user profile data to the console as follows:

1. From the CEC/IMC Manager's "CEC/IMC MOM Options" main menu, select the "Console Configuration" option. This will display the console configuration sub-menu.
2. From this sub-menu, select the "Console User Profile" option. This will display the "CONSOLE USER PROFILE CONFIGURATION" screen.
3. Verify the "CONSOLE" number matches the CIM's console number as defined by the CIM's DIP switches.
4. Verify the "Unit ID" number does not conflict with that of any other console or radio ID number in the system.
5. Select the correct "Setup" and then make any required modification(s) to the configuration. If required, save the new configuration.
6. Press the <F7> function key to send the Console User Profile configuration to the console.
7. When the "User Profile Successfully Written..." message is displayed, return to the CEC/IMC Manager main menu. If an "Unable to Write User Profile..." message

appears or no message appears after ten (10) seconds, the CIM may not be properly installed and/or configured. Check Controller Board installation and DIP switch settings. A "User Profile Successfully Written..." message must be received before continuing with the next procedure.

System Manager Database Uploads

System Manager databases contain all system information for all defined entities (units, groups, sites). These databases can be downloaded by the console by requesting database uploads from the CEC/IMC Manager. Since this data is broadcast to all consoles in the CEC/IMC system, if possible, all consoles should be on-line when this upload occurs. This avoids having to repeat the process for other consoles at a later time.

1. From the CEC/IMC Manager's "CEC/IMC MOM Options" main menu, select the "System Manager Data" option. This will display a sub-menu.
2. Select "Upload From System Manager".
3. From the "SYSTEM MANAGER UPLOAD STATUS" screen, select <F1> then <F8> for a full unit upload. After the upload is complete, exit the screen by pressing <Esc>.
4. From the "SYSTEM MANAGER UPLOAD STATUS" screen, select <F2> then <F8> for a full group upload. After the upload is complete, exit the screen by pressing <Esc>.
5. From the "SYSTEM MANAGER UPLOAD STATUS" screen, select <F6> then <F8> for a full site upload. After the upload is complete, exit the screen by pressing <Esc>.
6. From the "System Manager Data" sub-menu, select the "Upload From MOM PC" option.
7. From the "MOM PC BASED SYSTEM MANAGER UPLOAD STATUS" screen, select <F3> then <F8> for a full conventional channel upload. After the upload is complete, exit the screen by pressing <Esc>.
8. From the "MOM PC BASED SYSTEM MANAGER UPLOAD STATUS" screen, select <F5> then <F8> for a full console upload. After the upload is complete, exit the screen by pressing <Esc>.

Console Privilege Lists

Each console must be sent its privilege list from the CEC/IMC Manager as follows:

NOTE

System Manager database uploads must be accomplished before sending console privilege lists.

1. From the CEC/IMC Manager's "CEC/IMC MOM Options" main menu, select the "Console Configuration" option. This will display a sub-menu.
2. From this sub-menu, select the "Console Privilege List" option.
3. From the "CONSOLE PRIVILEGE LIST UPLOAD" screen, enter the number of the console (1 - 32).
4. Select <F7> to send the privilege list data to the console.

Saving Database Information

At the C3 Maestro console, the following database information is saved automatically to the PC's hard disk drive after the last record is received. No user action is required:

- User Profiles
- Hardware Configurations

The following data is not saved automatically, but on demand or by prompt:

- System Manager Upload Data
- CEC/IMC Manager Upload Data
- Module Set-Ups

To save upload data and module set-ups, press <F10> on either keyboard. This will save the data to the PC's hard disk.

SYSTEM TESTS

LOW-LEVEL TESTS

The following low-level tests verify the functionality of the PC's ability to control the Audio Tower's audio matrix

circuitry. It also verifies the line coupling circuitry and the speaker amplifier circuitry. Cross-point audio matrix switches are controlled (opened and closed) using the CTEST.EXE program. These low-level tests may be performed before any database initialization procedures. The tests *do not* represent a complete functional test of the console.

Recommended Test Equipment

- Audio Signal Generator (600-ohm output impedance)
- Handheld Multimeter
- Oscilloscope
- 600-Ohm Resistor
- Test Leads
- RJ-11 Modular Plugs (terminated with test leads)

Set-Up Procedure

- Verify all equipment has been interconnected in accordance with the previous installation instructions presented in this manual.
- At the Audio Tower, temporarily disconnect the RJ-11 plugs from the LINE A and LINE B modular jacks on the Audio PA Board (#1).
- Verify the Audio Tower and the PC are powered up.
- Start the CTEST program by typing CTEST followed by an <Enter> at the MS-DOS prompt. The current directory must be C:\UTIL. A copyright message and then the CTEST screen will appear.

Test Procedure

1. Send LINE A Input Audio to SPEAKER A

- Using the audio signal generator, inject a 0 dBm 1kHz tone into the LINE A balanced input on the Audio PA Board (#1). The balanced input is the two outside contacts on the RJ-11 modular jack (yellow and black wires in a modular cable).

- ❑ Send the LINE A input to the SPKR A output by typing the following commands:
 - <F2> 6771 <Enter>
 - <F2> 7771 <Enter>
 - <F2> 8731 <Enter>

NOTE

If no headset is connected to the Audio Tower the initial audio matrix switch settings will route the LINE A input to the SPKR A output. Therefore, in this case, execution of the above commands is not necessary.

- ❑ Verify the 1 kHz tone is heard in Speaker A. CTEST's VU meter should indicate yellow.
- ❑ Adjust the select speaker (Speaker A) volume knob up and down and verify the volume changes. This knob is the left-most volume knob on the Volume Controller Box.
- ❑ Turn the tone off by typing the following commands. The first command will turn it off:
 - <F2> 6770 <Enter>
 - <F2> 7770 <Enter>
 - <F2> 8730 <Enter>

Successful completion of this tests verifies basic operation of the following:

- Line A input circuitry
- Speaker A power amplifier circuitry
- PC and Logic Board's ability to control the cross-point audio matrix switches on the Audio Matrix Board
- Volume Controller Box select volume control and its related cabling
- VU meter circuitry

2. Send LINE B Input Audio to SPEAKER B

- ❑ Remove the RJ-11 modular plug from the LINE A jack and connect it to the LINE B balanced input. The balanced input is the two outside contacts on the RJ-11 modular jack (yellow and black wires in a modular cable).

- ❑ Verify the 1 kHz tone is heard in Speaker B. If not, send the LINE B input to the SPKR B output by typing the following command:
 - <F2> 6641 <Enter>
- ❑ Adjust the unselect speaker (Speaker B) volume knob up and down and verify the volume changes.
- ❑ Turn the tone off by typing the following command:
 - <F2> 6640 <Enter>

Successful completion of this tests verifies basic operation of the following:

- Line B input circuitry
- Speaker B power amplifier circuitry
- PC and Logic Board's ability to control the cross-point audio matrix switches on the Audio Matrix Board
- Volume Controller Box unselect volume control and its related cabling

3. Send Mic Audio To LINE A & LINE B Outputs

- ❑ If necessary, connect a headset to operator headset jack box. Verify this jack box is connected to the OPERATOR HEADSET connector on the Audio Matrix Board (#1).
- ❑ Terminate the Audio PA Board's (#1) LINE A balanced output terminals with a 600-ohm resistor. The balanced output is the two center-most contacts on the RJ-11 modular jack (red and green wires in a modular cable). Connect an oscilloscope across this load resistor.
- ❑ Send operator headset mic audio to the LINE A output by typing the following commands:
 - <F2> 6331 <Enter>
 - <F2> 1001 <Enter>
- ❑ Speak into the headset's mic and verify the audio signal is present on the LINE A balanced output. Maximum signal level is approximately 6 Vp-p.
- ❑ Turn the operator headset mic-to-LINE A audio off by typing the following command:
 - <F2> 1000 <Enter>
- ❑ Verify mic audio is no longer on the LINE A balanced output.
- ❑ Move the LINE A balanced output 600-ohm termination to the LINE B balanced output.

- ❑ Send operator headset mic audio to the LINE B output by typing the following command:
 <F2> 2001 <Enter>
- ❑ Speak into the headset's mic and verify the audio signal is now present on the LINE B balanced output. Maximum signal level is approximately 6 Vp-p.
- ❑ Turn the operator headset mic-to-LINE B audio off by typing the following commands. The audio should turn off after the first command is entered:
 <F2> 6330 <Enter>
 <F2> 2000 <Enter>
- ❑ Verify mic audio is no longer on the LINE B balanced output.

Successful completion of this tests verifies basic operation of the following:

- operator headset mic input circuitry
- Line A and B output circuitry
- PC and Logic Board's ability to control the cross-point audio matrix switches on the Audio Matrix Board

4. Test Audio PA Board #2 (if installed)

If a second Audio PA Board is installed in the Audio Tower, the following procedure can be used to test it:

- ❑ Power-down the Audio Tower and swap the #1 board with the #2 board.
- ❑ Power-up the Audio Tower.
- ❑ Repeat steps 1, 2 and 3.
- ❑ Power-down the Audio Tower and swap the #1 board with the #2 board.
- ❑ Power-up the Audio Tower.

5. Completion

- ❑ Remove all test connections and reconnect the RJ-11 modular plugs from the CEC/IMC to the

LINE A and LINE B modular jacks on the Audio PA Board (#1).

HIGH-LEVEL TESTS

The following high-level tests verify basic operational status of control data and audio interfaces between the C3 Maestro console and the CEC/IMC. The procedures assume all equipment has been interconnected and set-up in accordance with the previous instructions presented in this manual.

Control Data Link

The C3 Maestro console and the CIM within the CEC/IMC periodically poll each other over the control data link. If this link is not operating correctly the console will display a "Com Error: link down @xxxxx bps" error message on the PC's video display monitor. This link must be up (operating) before *any* dispatch operation can occur. For troubleshooting information, refer to the *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* maintenance manual, LBI-38938. The console-to-CIM link up/down status can also be viewed via the CEC/IMC Manager's (MOM PC's) "SYSTEM DISPLAY" screen.

Upon restoration of a failed console-to-CIM control data link a "Communications error condition cleared" message is displayed.

Audio Links

After determining the control data link is operating by the lack of an error message, audio link operation can be tested. To test, program a module with a test group and then place a call to and from a test radio set the same group. Also test the operation of all unselect speakers. Verify the console can send and receive audio. If necessary, refer to the C3 Maestro console operator's manual. Refer to LBI-38938 for troubleshooting information.

If the console is equipped with a Call Director, test Call Director patch operation by patching a radio to a telephone line. See the operator's manual for details.



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